

U.S. Serial No. 10/681,877
October 21, 2005
Reply to the Office Action dated May 31, 2005
Page 5 of 11

REMARKS/ARGUMENTS

Claims 1-11 and 18-21 are pending in this application. By this Amendment, Applicants CANCEL claims 12-17, AMEND claims 1, 4-7, 10, and 11, and ADD new claims 18-21.

Applicants affirm the election of claims 1-11 without traverse. Applicants reserve the right to file a Divisional Application to pursue prosecution of non-elected claims 12-17.

Claims 1, 2, 6-8, and 11 were rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. (US 6,776,861). Claims 1, 5-7, and 11 were rejected under 35 U.S.C. 102(b) as being anticipated by Nishide et al. (US 6,265,090), Nishigaki et al. (US 4,795,670), or Ogihara et al. (US 4,764,233). Claims 1-11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al., Nishide et al., Nishigaki et al., or Ogihara et al. Applicants respectfully traverse the rejections of claims 1-11.

Claim 1 has been amended to recite:

"A multilayer composite comprising:
an insulating substrate; and
patterned conductive layers and insulating layers alternately laminated on the insulating substrate to define a laminate; wherein
at least one of the insulating layers defines a correcting insulating layer including vitreous silica and quartz; and
the ratio of vitreous silica to quartz in the correcting insulating layer differs from that in the other insulating layers such that the thermal expansion coefficient of the correcting insulating layer differs from that of the insulating layers that do not define the correcting insulating layer, such that the correcting insulating layer corrects the warpage of the laminate attributed to a difference in thermal expansion coefficients between the insulating layers that do not define the correcting insulating layer, the patterned conductive layers, and the insulating substrate." (Emphasis added.)

Claim 7 recites features similar to the features recited in claim 1, including the features emphasized above.

With the unique combination of features recited in Applicants' claims 1 and 7, Applicants have been able to correct the warpage of a multilayer laminate by adjusting

U.S. Serial No. 10/681,877
October 21, 2005
Reply to the Office Action dated May 31, 2005
Page 6 of 11

the composition of the insulating layers, depending on whether the warp of the laminate is concave or convex and how much the laminate is warped. This provides a correcting insulating layer that corrects the warpage of the laminate more easily and precisely and, therefore, produces a flat multilayer composite (see, for example, the first full paragraph on page 4 and the paragraph bridging pages 9 and 10 of Applicants' originally filed application).

First, the Examiner alleged in Section No. 7 of the outstanding Office Action that Wang et al. teach all of the features recited in Applicants' claims 1 and 7, including a constraining tape 102 (allegedly corresponding to the correcting insulating layer recited in Applicants' claims 1 and 7) that ensures x-y shrinkage of the primary tape is minimal, if not zero. The Examiner did not indicate what elements of Wang et al. correspond to the patterned conductive layers and the insulating layers of Applicants' claims 1 and 7. The Examiner took the position that the constraining tapes taught by Wang et al. "resemble" the correcting insulating layer(s) claimed by Applicants (see the first full paragraph on page 4 of the outstanding Office Action). Applicants respectfully disagree.

Claim 1 has been amended to recite "the ratio of vitreous silica to quartz in the correcting insulating layer differs from that in the other insulating layers such that the thermal expansion coefficient of the correcting insulating layer differs from that of the insulating layers that do not define the correcting insulating layer, such that the correcting insulating layer corrects the warpage of the laminate."

In contrast to Applicants' claims 1 and 7, Wang et al. do not teach or suggest the feature of "the ratio of vitreous silica to quartz in the correcting insulating layer differs from that in the other insulating layers." Wang et al. only teach that the glass of the constraining layer attains its transition temperature earlier than the glass of the primary tape and that crystallization of the glass of the constraining layer occurs very soon after its transition temperature having the result of stiffening the glass before the glass of the primary tape. Thus, this constraining influence on the primary tape ensures that x,y shrinkage of the primary tape is minimal (see, for example, column 3, line 42 through column 4, line 26 of Wang et al.). Nowhere do Wang et al. teach or suggest that the

U.S. Serial No. 10/681,877
October 21, 2005
Reply to the Office Action dated May 31, 2005
Page 7 of 11

ratio of vitreous silica to quartz in the correcting insulating layer differs from that in the other insulating layers such that the correcting insulating layer corrects the warpage of the laminate. In fact, Wang et al. fail to teach or suggest anything at all about the ratio of vitreous silica to quartz.

The Examiner is reminded that a "claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

In further contrast to claims 1 and 7, Wang et al. do not teach or suggest the feature of "the thermal expansion coefficient of the correcting insulating layer differs from that of the insulating layers that do not define the correcting insulating layer, such that the correcting insulating layer corrects the warpage of the laminate." As stated above, the constraining layer of Wang et al. attempts to "constrain" warpage of the laminate, whereas Applicants' claims 1 and 7 "corrects" the warpage of the laminate. The correcting insulating layer "corrects" the warpage of a laminate by providing a difference in thermal expansion coefficients between the insulating layers that do not define the correcting insulating layer, the patterned conductive layers, and the insulating substrate. Thus, Wang et al. teaches away from Applicants' claims 1 and 7 by attempting to eliminate warping stresses in the constraining tape and thereafter constraining warping in the primary tape. However, Applicants' claims 1 and 7 utilize the warping stresses (compressive or tensile) of the correcting insulating layer to "correct" a preexisting warpage of the overall laminate (see, for example, the paragraph bridging pages 9 and 10 of Applicants' originally filed application).

A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that the applicant took. In re Gurley, 27 F.3d 551, 31 USPQ 2d 1130, 1131 (Fed. Cir. 1994).

In fact, Wang et al. specifically teach that the coefficient of thermal expansion of both the constraining tape and the primary tape must be sufficiently close in magnitude

U.S. Serial No. 10/681,877
October 21, 2005
Reply to the Office Action dated May 31, 2005
Page 8 of 11

(see, for example, column 4, lines 52-56 of Wang et al.). Thus, Wang et al. certainly do not teach or suggest the feature of "the thermal expansion coefficient of the correcting insulating layer differs from that of the insulating layers that do not define the correcting insulating layer, such that the correcting insulating layer corrects the warpage of the laminate" as recited in Applicants' claims 1 and 7.

Accordingly, Applicants respectfully submit that Wang et al. fail to teach or suggest the unique combination and arrangement of elements recited in claims 1 and 7 of the present application.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1, 2, 6-8, and 11 under 35 U.S.C. 102(e) as being anticipated by Wang et al.

Second, the Examiner alleged that each of Nishide et al., Nishigaki et al., and Ogiwara et al. teach ceramic insulating layers made of glass and quartz. The Examiner then took the position that the insulating layers comprised of glass and quartz "inherently possess the warping or distortion correcting function." See page 5 of the outstanding Office Action. Applicants strongly disagree.

Claim 1 has been amended to recite "the ratio of vitreous silica to quartz in the correcting insulating layer differs from that in the other insulating layers such that the thermal expansion coefficient of the correcting insulating layer differs from that of the insulating layers that do not define the correcting insulating layer, such that the correcting insulating layer corrects the warpage of the laminate."

In contrast to Applicants' claims 1 and 7, none of Nishide et al., Nishigaki et al., and Ogiwara et al. teaches or suggests the feature of "the ratio of vitreous silica to quartz in the correcting insulating layer differs from that in the other insulating layers." In fact, none of Nishide et al., Nishigaki et al., and Ogiwara et al. teaches or suggests anything at all with respect to the ratio of vitreous silica to quartz or that a correcting insulating layer has a different ratio than the other insulating layers.

In further contrast to claims 1 and 7, none of Nishide et al., Nishigaki et al., and Ogiwara et al. teaches or suggests the feature of "the thermal expansion coefficient of

U.S. Serial No. 10/681,877
October 21, 2005
Reply to the Office Action dated May 31, 2005
Page 9 of 11

the correcting insulating layer differs from that of the insulating layers that do not define the correcting insulating layer, such that the correcting insulating layer corrects the warpage of the laminate." In fact, none of Nishide et al., Nishigaki et al., and Ogihara et al. teaches or suggests anything at all with respect to the thermal expansion coefficient of the correcting insulating layer or that the thermal expansion coefficient of the correcting insulating layer differs from that of the insulating layers that do not define the correcting insulating layer, such that the correcting insulating layer corrects the warpage of the laminate.

The Examiner is reminded that a "claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Accordingly, Applicants respectfully submit that none of Nishide et al., Nishigaki et al., and Ogihara et al. teaches or suggests the unique combination and arrangement of elements recited in claims 1 and 7 of the present application.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1, 5-7, and 11 under 35 U.S.C. 102(b) as being anticipated by Nishide et al., Nishigaki et al., or Ogihara et al.

Third, the Examiner alleged that each of Wang et al., Nishide et al., Nishigaki et al., and Ogihara et al. teaches all of the features recited in Applicants' claims with exception of the conductive layers being made from a photosensitive conductive paste and the insulating layers being made from a photosensitive insulating paste. The Examiner further stated that "one skill in the art would modify or choose a desired material for the insulating layers and the conductive layers because it is a matter of design scheme" (see section 10 on page 6 of the outstanding Office Action). Applicants respectfully disagree.

The Examiner is reminded that prior art rejections must be based on evidence. Graham v. John Deere Co., 383 U.S. 117 (1966). The Examiner is hereby requested to cite a reference in support of her position that it was well known at the time of

U.S. Serial No. 10/681,877
October 21, 2005
Reply to the Office Action dated May 31, 2005
Page 10 of 11

Applicants' invention to make the conductive layers from a photosensitive conductive paste and the insulating layers from a photosensitive insulating paste. If the rejection is based on facts within the personal knowledge of the Examiner, the data should be supported as specifically as possible and the rejection must be supported by an affidavit from the Examiner, which would be subject to contradiction or explanation by affidavit of Applicants or other persons. See 37 C.F.R. § 1.104(d)(2).

Therefore, the Examiner has failed to establish a prima facie case of obviousness of the claimed invention because all the claim features must be taught or suggested by the prior art. See In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974) and MPEP § 706.02(j) and § 2143.03.

Accordingly, Applicants respectfully submit that none of Wang et al., Nishide et al., Nishigaki et al., and Ogiwara et al. teaches or suggests the unique combination and arrangement of elements recited in claims 1 and 7 of the present application.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-11 under 35 U.S.C. 103(a) as being unpatentable over Wang et al., Nishide et al., Nishigaki et al., or Ogiwara et al.

New claims 18-21 depend either from claim 1 or claim 7 and are therefore allowable for at least the reasons that claims 1 and 7 are allowable.

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

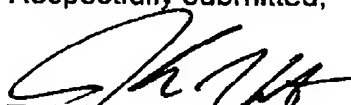
To the extent necessary, Applicants petition the Commissioner for a Two-month extension of time, extending to October 31, 2005, the period for response to the Office Action dated May 31, 2005.

U.S. Serial No. 10/681,877
October 21, 2005
Reply to the Office Action dated May 31, 2005
Page 11 of 11

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

Date: October 21, 2005



Attorneys for Applicants

Joseph R. Keating
Registration No. 37,368

Christopher A. Bennett
Registration No. 46,710

KEATING & BENNETT LLP
8180 Greensboro Drive, Suite 850
Tyson's Corner, VA 22102
Telephone: (703) 637-1480
Facsimile: (703) 637-1499